

H 26  
S/051/61/011/006/004/012  
E032/E114

AUTHORS: Tatevskiy, M., Koptev, G.S., and Mal'tsev, A.A.  
TITLE: Vibrational spectra of the  $B_2O_3$  and  $B_2S_3$  molecules

PERIODICAL: Optika i spektroskopiya, v.11, no.6, 1961, 724-729

TEXT: In a previous paper (A.A. Mal'tsev, V.N. Matveyev, V.M. Tatevskiy, DAN SSSR, v.137, 123, 1961) it was shown that the frequency of the antisymmetric BO vibration is about  $900\text{ cm}^{-1}$ , while D. White, D.E. Mann, P.N. Walsh and A. Sommer (Ref.3, J. Chem. Phys., v.32, 481, 1960) reported the figure of  $1302\text{ cm}^{-1}$ . The aim of the present work was to explore the possible reasons for this discrepancy. The authors describe a calculation of the vibrational spectra of the  $B_2^{10}O_3$  and  $B_2^{11}O_3$  molecules, and have

recalculated the spectra of  $B_2^{10}B_2^{11}O_3$ ,  $B_2^{10}S_3$  and  $B_2^{11}S_3$ . The calculated frequencies of bands in the vibrational spectra of  $B_2^{10}O_3$ ,  $B_2^{10}B_2^{11}O_3$ ,  $B_2^{11}O_3$ ,  $B_2^{10}S_3$  and  $B_2^{11}S_3$  are shown in the following table:

Card 1/ 3

Vibrational spectra of the  $B_2O_3$  andS/051/61/011/006/004/012  
E032/E114

Vibration	Symmetry	$B^{10}O_{2\ 3}$	$B^{10}B^{11}O_{2\ 3}$	$B^{11}O_{2\ 3}$	$B^{10}S_{2\ 3}$	$B^{11}S_{2\ 3}$
$\nu_1$	$A_1$	2084	2022	2025	1359	1306
$\nu_2$		844	829	815	425	409
$\nu_3$		755	754	749	399	396
$\nu_4$		161	161	160	66	64
$\nu_5$	$B_1$	2097	2091	2029	1364	1317
$\nu_6$		938	936	933	463	461
$\nu_7$		682	668	658	347	333
$\nu_8$		778	768	753	374	360
$\nu_9$	$B_2$	700	685	673	351	336

The calculations show that the bands 1302 and 742  $\text{cm}^{-1}$  which are observed in the infrared emission spectrum of vapours over boric anhydride are due to the liquid phase and not the  $B_2O_3$ .

Card 2/ 3

Vibrational spectra of the  $B_2O_3$  and .. S/051/61/011/006/004/012  
E032/E114

molecule. The  $993\text{ cm}^{-1}$  band in the spectrum of boron sulphide is due to the spectrum of liquid  $B_2S_3$ . It is suggested that in order to obtain more accurate values for the force constant and in order to increase the accuracy of the vibrational frequencies, more accurate spectroscopic studies are necessary in the region of  $900\text{ cm}^{-1}$  where it is expected that there are bands due to antisymmetric BO vibrations.

There are 1 table and 17 references: 5 Soviet-bloc and 12 non-Soviet-bloc. The four most recent English language references read as follows:

Ref. 3: D. White, D.E. Mann, P.N. Walsh, A. Sommer, J.Chem.Phys., v.32, 481, 1960.

Ref.11: A. Sommer, P.N. Walsh, D. White, J.Chem.Phys., v.33, 296, 1960.

Ref.12: C.W.F.T. Pistorius, J.Chem.Phys., v.31, 1454, 1959.

Ref.16: J.L. Parsons, M.E. Milberg, J.Amer.Ceram.Soc., v.43, 326, 1960.

SUBMITTED: January 2, 1961

Card 3/3

VYGODSKAYA, Ye.M.; IATEVSKIY, V.M.

Method of estimating the physicochemical properties of boron  
alkyls. Vest. Mosk. un. Ser. 2: Khim. 19 no.6:8-10 N-D '64.  
(MIRA 18:3)

I. Katedra fizicheskoy khimii Moskovskogo universiteta.

KOPTEV, G.S.; PANCHENKO, Yu.N.; TYULIN, V.I.; TATEVSKIY, V.M.

Calculating the frequency and vibration pattern of two isotopic forms of the molecules of 1,3-butadiene  $C_4H_6$  and  $C_4D_6$ . Opt. i spektr. 19 no.2:194-197 Ag '65. (MIRA 18:8)

SEY, E.; YAGODA, S.G.; TROFIMOV, V.N.

Dipole moment - I. Dependence of the general formula in RnH.  
Vest. Moskov. Univ. Ser. 2 Khim. 20 no. 3, 15-29. May-June '65.

(MIRA 18:2)

De. Moskovskiy universitet, kafedra fizicheskoy khimii.

TATEVSKIY, V.M.; SPIRIDONOV, V.P.

Remarks on G.V. Bykov's article "The terms electronegativity and electrophilic characteristic of atoms in molecules" and on "Electronegativity of atoms (atomic cores) in molecules." Part 1. Zhur. fiz. khim. 39 no.5:1284-1289 My '65.

Remarks on G.V. Bykov's articles "Term of electronegativity and electrophilic characteristic of atoms in molecules" and "Electronegativity of atoms (atomic cores) in molecules. Part 2. Ibid.:1291-1295 (MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

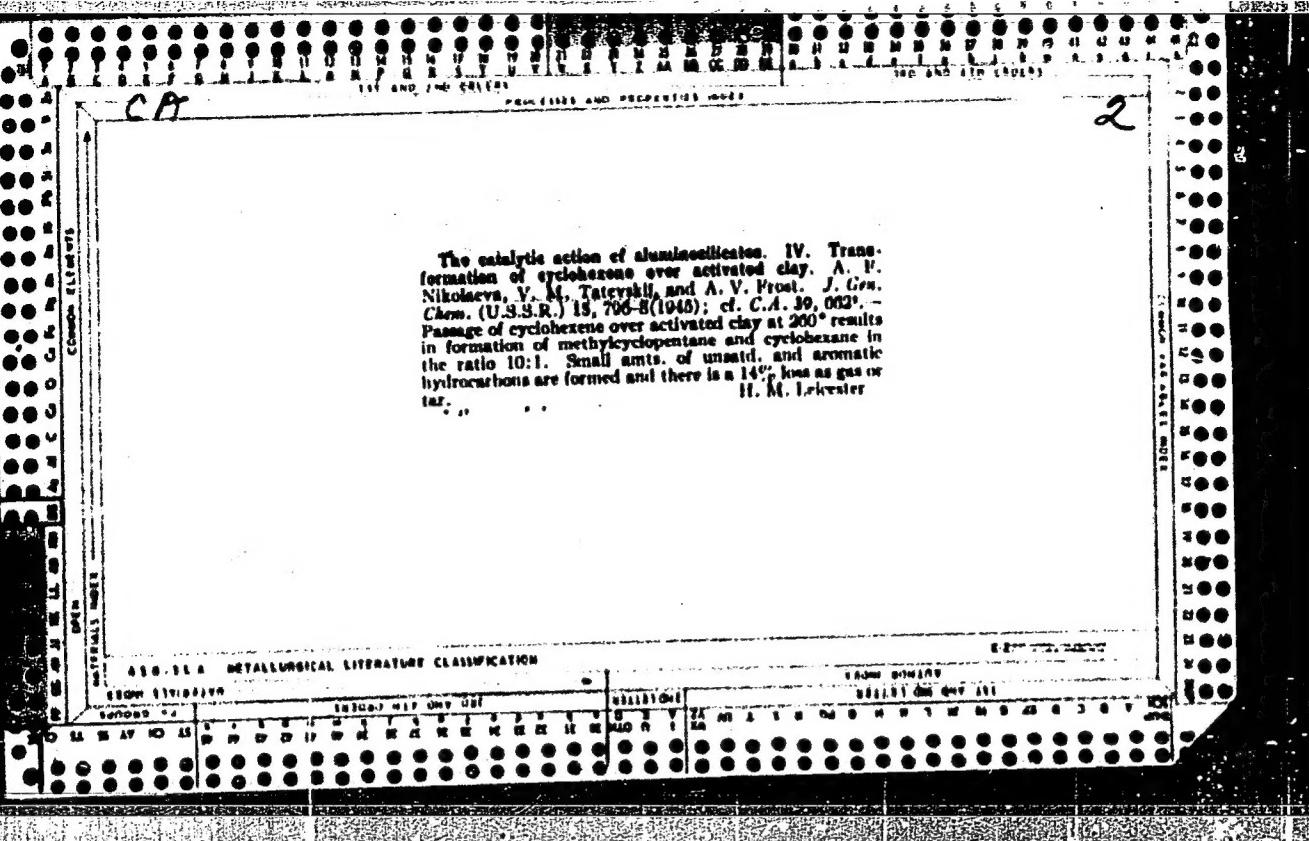
GEY, E.; YAROVOY, S.S.; TATEVSKIY, V.M.

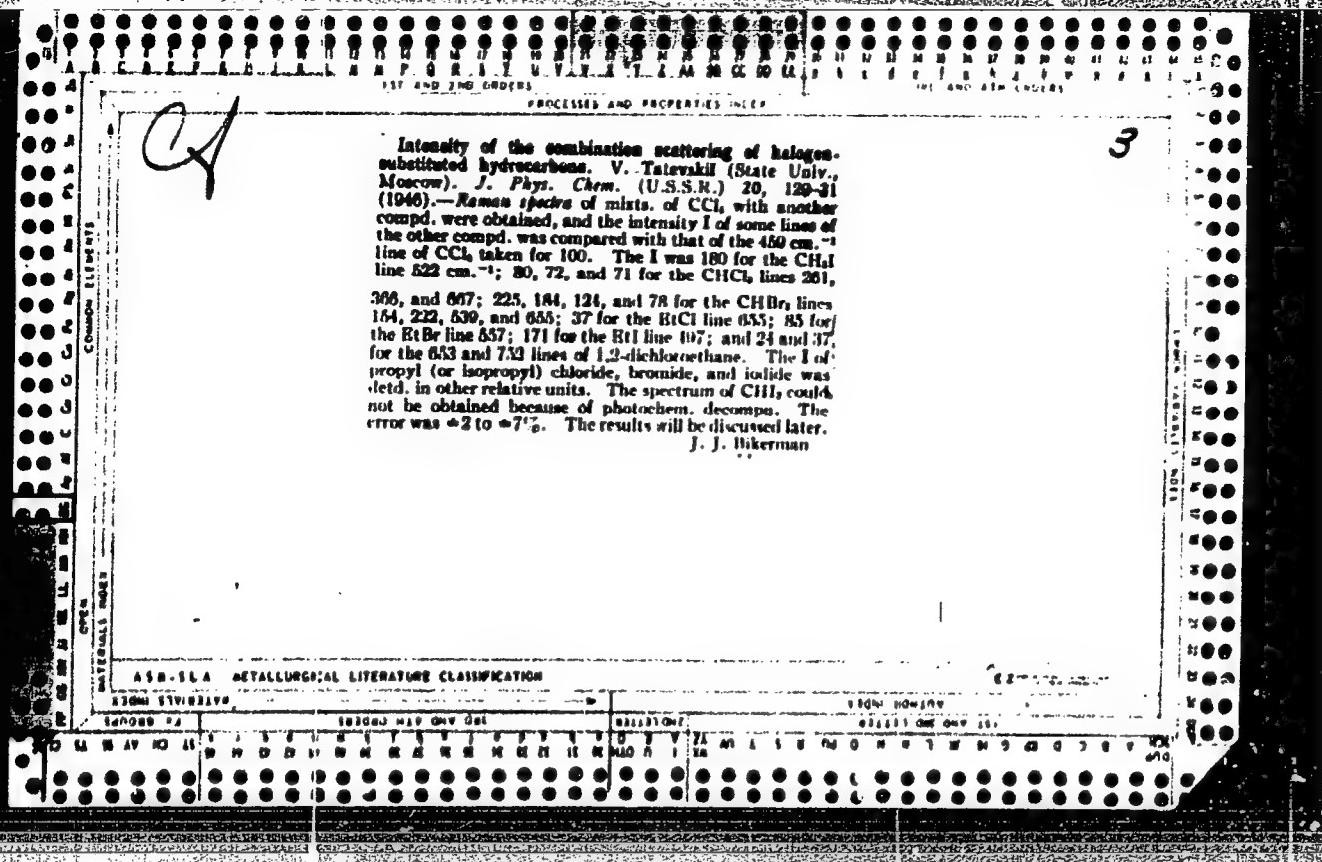
Dipole moments of compounds of the general formula  $A_nB_{2n+2}$ .  
West. Mosk. un. Ser. 2:Khim. 20 no.4:3-6 Jl-Ag '65.

(MIRA 18:10)

1. Kafedra fizicheskoy khimii Moskovskogo gosudarstvennogo  
universiteta.

Tate ~~sky~~, V. Vibrations of polyatomic molecules. Akad.





TATEVSKIY, V. M.

Mar 1947

USSR/Chemistry - Ethylene

Chemistry - Ethane

"Calculation of the Reaction Equilibrium of Chlorine Substitution in Ethylene and Ethane," V. M. Tatevskiy, Izotomiya, Prof. A. V. Frost, 19 pp.

" Vestnik Moskovskogo Universiteta" No 3

1947

By methods of statistical thermodynamics from thermochemical and spectroscopic data, calculations have been made of the equilibrium constant and mole fractions in equilibrium mixture for 13 reactions of chlorine substitution in ethylene and ethane in the temperature range 0 - 600° C. The barrier between trans- and laevo-forms of dichloroethane has been approximately calculated, the value  $V_0 \approx 3,000 - 2473$

Mar 1947

USSR/Chemistry - Ethylene (Contd)

Mar 1947

4,000 cal/mol having been obtained, which agrees satisfactorily, within the limits of precision of the computation, with the results obtained by other methods.

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If  $\partial_t \psi = 0$ , then  $\partial_t \psi = -\partial_t \psi$ . If  $\partial_t \psi = 0$ , the variation of  $\psi$  satisfying  $\partial_t \psi = 0$  is  $\psi(t) = 0$ .

The new variables  $\eta$  and  $\zeta$  are called dependent variables of type I and II respectively. The degrees of freedom of the variables  $\eta$  and  $\zeta$  are computed in the same way as the degrees of freedom of the original variables  $y_1, y_2, \dots, y_n$ . The degrees of freedom of the new variables  $\eta$  and  $\zeta$  are given by the formulae

REVIEWED  
SEARCHED  
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SERIALIZED  
FILED  
JULY 17 1947  
FBI - NEW YORK  
The standard deviation of the addition sum of all  
polyatomic gases measured at 25°C.

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APPROVED FOR RELEASE: 07/16/2001

CIA-RDP86-00513R001755110017-3"

TATEVSKIY, V. M.

42039: ARONOV, O. L.; TATEVSKIY, V. M.; FROST, A. V. - Issledovanie potatsionnoy izomerii hekotorykh I - Digalogenogtanov metodom kombinatsionnogo rasseyaniya sveta. (Kratkoe soderzhaniye doklada). Izvestiya akad. Nauk SSSR, Seriya Fiz., 1946, No. 5, S. 666.

SO: Letopis' Zhurnal'nykh Statey, Vol. 47, 1948.

TATEVSKIY, V. M.

25401. YURBEV, Y. K., TATEVSKIY, V.M. i GRAGEROV, I.P.  
Spektry kombinatsionnogo rasseyaniya tiofana i ego gomologov. Zhurnal fiz.  
Khimii, 1948, Vyp. 7., 783-86. Bibliogr: 6 Nazv. Sm Takzhe No. 25427  
SO: Letopis' Zhurnal Statey, No. 30, Moscow, 1948

TATEVSKIY, V. M.

42097. TATEVSKIY, V. M. O kataliticheskoy aktivnosti sistemy adsorbent/  
adsorbirovannoye veshehestvo. Vestnik Mosk. un-ta, 1948, No 8,  
s. 77-83.- Bibliogr: 5 nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 36, 1948

TATEVSKIY, V. N.

Tatevskiy, V. N. and Finkel'shteyn, A. I. "An approximate method of calculating determinants of a special type", Vestnik Mosk. un-ta, 1943, No. 10, p. 63-74.

SO: U-3042, 11 March 53, (letopis 'nykh Statey, No. 10, 1949).

TATEVSKIY, -  
ARONOV, O.L., TATEVSKIY, V.M., AND FROST, A.V.

"Study of Rotational Isomerism by the Combination Light Dispersion Method. IV. Spectra  
of Combination Dispersion of 1, 1., 2, 2-tetrachloroethane at Various Temperatures."  
Vestnik Moskovskogo Universiteta, no. 11, 1948

TATEVSKIY, V. M.

Tatevskiy, V. M. - "Combination scattering spectra of aromatic C<sub>6</sub> hydrocarbons,"  
Vestnik Mosk. un-ta, 1948, No. 11, p. 149-53

So: U 3566, 15 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 13, 1949)

TATEVSKIY, V. M.

USSR/Chemistry - Isomerism  
Chemistry - Spectra

Sep/Oct 48

"Studies of the Rotational Isomerism of Some 1,2-Dihalogen-ethanes by the Method of Combined Dispersion of Light," D. L. Aronov, V.M. Tatevskiy, A. V. Frost,  $\frac{1}{2}$  P

"Iz Ak Nauk SSSR, Ser Fiz" Vol XIII, No 5

Studies combination dispersion spectra of 1,2-dichloroethane, 1-chloro, 2-bromo-ethane, 1,2-dibromoethane and 1,1,2,2-tetrachloroethane in the liquid phase over a wide range of temperatures. (Synopsis. For detailed description, see "Vest Moskov U" 1, 125, 1943.)

PA 19/49T4

TATEVSKIY, V. M.

ISR/Chemistry - Organic Compounds Determination of  
Aromatic in Gasoline  
Chemistry - Analysis, Spectrochemical

Sep 48

Quantitative Determination of Aromatic Hydrocarbons C<sub>6</sub>-C<sub>8</sub> in Cracking Gasoline by the Method  
of Combined Dispersion of Light,\* M. D. Tilichayev, P. A. Akishin, Ye. G. Treshchova, V. M.  
Tatevskiy, Cen Inst of Aviation Fuels and Lubricants and Moscow State U, 8½ pp

Iavod Lab\* Vol XIV, No 9

Measures frequency and intensities of lines in combination dispersion spectra of aromatics-  
methylbenzenes, o-, m-, and p-xylenes. Demonstrates possibility of determining these aromatics in  
cracking gasolines in the presence of alkenes by this method for 60 artificial mixtures. Con-  
centration of individual compounds varied 2-40%.

16/49126

"APPROVED FOR RELEASE: 07/16/2001

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TATEVSKIY, V. M.

CA: 43-8387/h

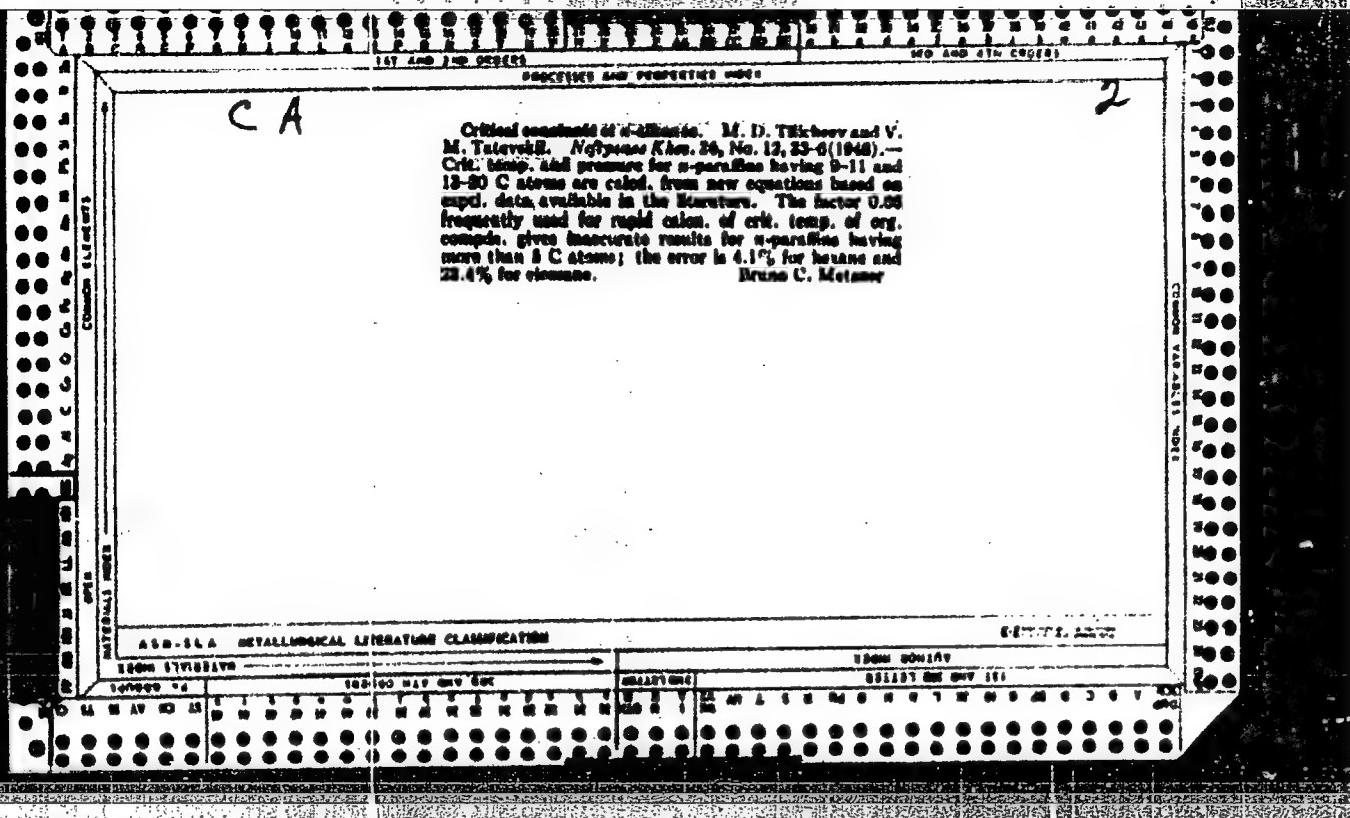
YUR'YEV, YU. K., TATEVSKIY, V. M. and GRAGEROV, I. I.

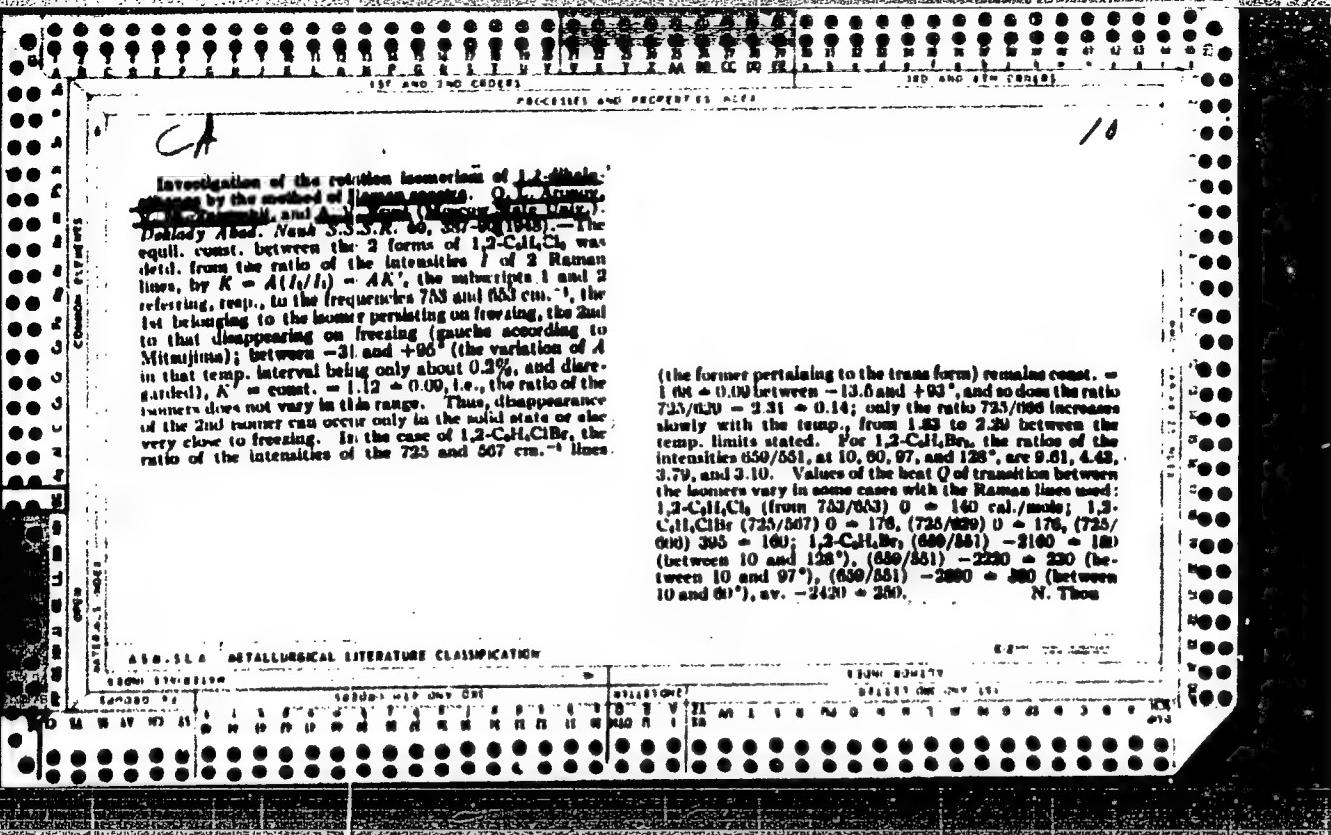
J. Phys. Chem (USSR) 22, 783-6 (1948)

Raman spectra of thiophane and its homologs.

APPROVED FOR RELEASE: 07/16/2001

CIA-RDP86-00513R001755110017-3"





TATEVSKII, V.M.

Hindered rotation in the 1,2-dihalothane series. O. L. Aronov, V. M. Tatevskii, and A. Frost (Moscow State Univ.); Doklady Akad. Nauk S.S.R. 60, 1177-80 (1948); cf. preceding abstr.—The ratio of the intensities  $I$  of the Raman lines 753/653 cm.<sup>-1</sup> of 1,2-C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub> was detd. in various solvents: pure liquid 1.12; in CCl<sub>4</sub> (75.2, 50.3, 24.6 mole % of 1,2-C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub>) 1.37, 1.08, 3.17; in C<sub>6</sub>H<sub>6</sub> (78.7, 61.4, 23.0) 1.37, 1.23, 2.03; in cyclohexane (76.2, 50.2, 26.4) 1.24, 1.03, 2.70; in C<sub>2</sub>H<sub>6</sub> (78.7, 61.4, 23.0) 1.31, 1.47, 2.10; in C<sub>4</sub>H<sub>10</sub> (88.7, 63.4, 25.4) 1.14, 1.13, 1.25; in EtOH (88.0, 54.0) 1.04, 1.20; in PhNO<sub>2</sub> (43.5, 23.1) 0.03, 0.81. For 1,3-C<sub>2</sub>H<sub>4</sub>Br<sub>2</sub>, line 659/551 (the variations at 100 mole % are due to insufficient constancy of the temp.): in CCl<sub>4</sub> (100, 84.0, 43.3, 19.2) 7.0, 7.2, 6.0, 6.2; in C<sub>6</sub>H<sub>6</sub> (100, 60.4, 22.6) 7.0, 4.5, 3.7; in cyclohexane (100, 52.5, 54.1, 24.8) 0.1, 8.9, 6.3, 5.3; in C<sub>2</sub>H<sub>6</sub> (100, 42.4, 21.4) 7.0, 7.2, 7.8; in C<sub>4</sub>H<sub>10</sub> (100, 40.7, 15.2) 7.0, 5.7, 3.9; in EtOH (100, 60.1, 12.7) 9.1, 8.9, 4.6; in PhNO<sub>2</sub> (100, 41.7, 15.1) 9.1, 4.1, 2.1. For 1,2-C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub>, the dependence of the equil. const. of the 2 rotation isomers ( $K = A I_1/i_1$ ) on the solvent is great-

est in the case of nonpolar solvents. Almost no change is found in solvents with a dipole moment close to that of C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub> itself, e.g. EtOH. Some lowering of  $K$ , as compared with the pure liquid, is found in solvents with a dipole moment higher than that of C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub>. The effect of a nonpolar solvent being primarily one of diln., it follows that the 1st form is little polar or nonpolar, while the 2nd form has a higher dipole moment. A solvent with a high dipole moment shifts the equil. in favor of the 2nd form. Strikingly, C<sub>4</sub>H<sub>10</sub> behaves more like a solvent of medium polarity, rather than as a nonpolar liquid; this may be due to its polarizability, giving rise to induced dipole moments. The foregoing considerations are not applicable to 1,2-C<sub>2</sub>H<sub>4</sub>Br<sub>2</sub>.

N. Thea

PA 78T14

TATEVSKIY, V. M.

SSSR/Chemistry - Ethane, 1,2-Dichloro  
Chemistry - Ethane, 1,2-Dibromo

Jun 1948

"Rotational Isomers of 1,2-Dichloroethane and 1,2-Dibromoethane in Solution at Different Temperatures,"  
O. L. Aronov, V. M. Tatevskiy, A. V. Frost, Moscow  
State U imeni M. V. Lomonosov, 3 pp

"Dok Ak Nauk SSSR" Vol IX, No 8

Study the spectra of subject substances to explain  
the effect of various factors on the equilibrium of  
rotational isomers in these compounds. Submitted by  
Acad A. A. Balandin 13 Apr 1948.

78T14

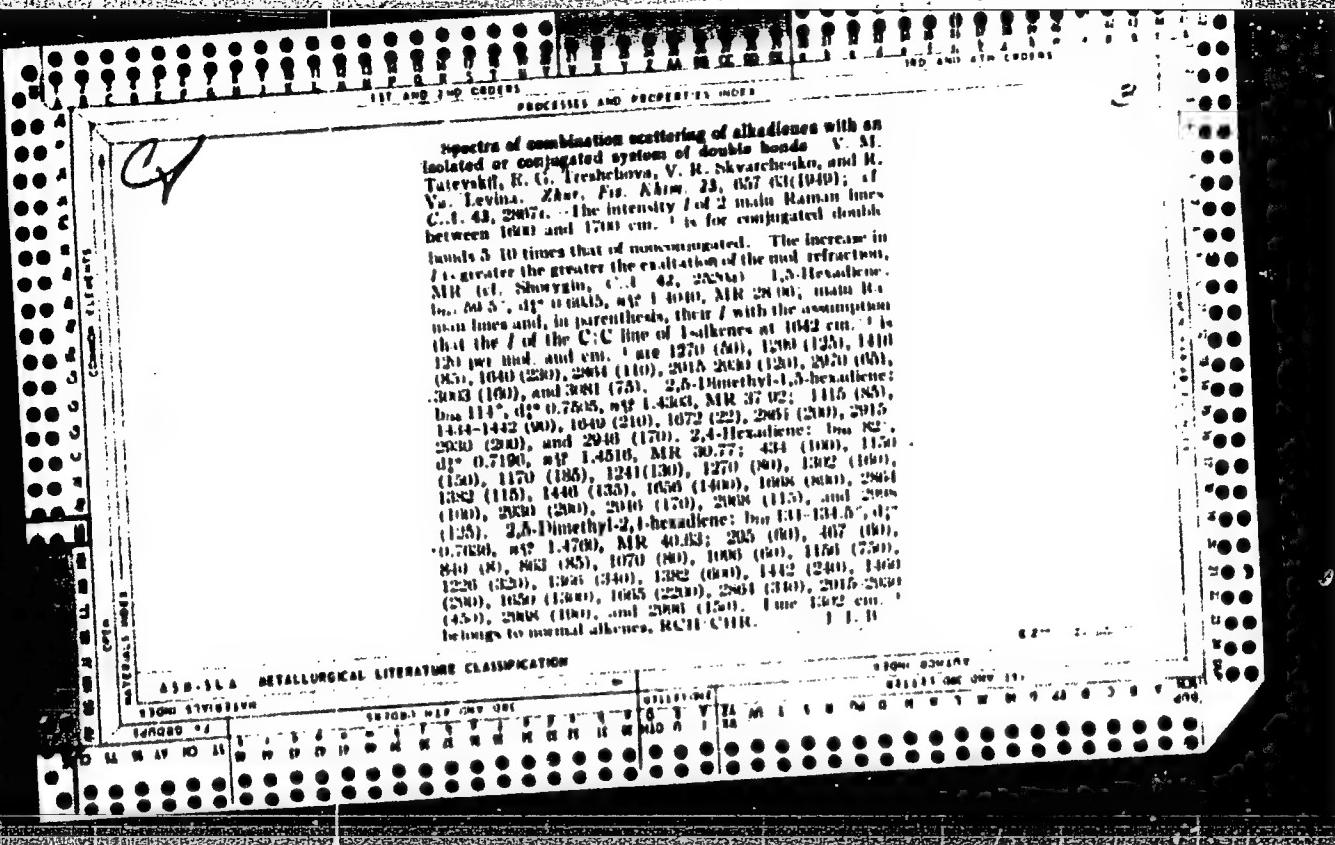
USSR/Chemistry - Hydrocarbons, Aromatic      Aug 48  
Chemistry - Hydrocarbons, Raman Spectra

"Spectra of the Combined Dispersion of Aromatic C<sub>8</sub>  
Hydrocarbons," Ye. G. Treshchova, V. M. Tatevskiy,  
Moscow State U imeni M. V. Lomonosov, 4 pp

"Dok Ak Nauk SSSR" Vol LXI, No 5

Raman spectra of following hydrocarbons with the purity indicated are reported: ethylbenzene 99.4%, o-xylene 98.4%, m-xylene (purity undetermined) and p-xylene 97.2%.

24/49T17



AKISHIN, P. A., KELIE, V. I., TATEVSKIY, V. M., SILAYEV, A. V.

Biophysics.

One mistaken theory of Professor Kobozev. Vest. Mosk. un. 5 no. 8, 1950.

9. Monthly List of Russian Accessions, Library of Congress, November 1953<sup>2</sup>, Uncl.

CA

2

**Problems of the chemical structure of hydrocarbons. I.**  
 Laws of geometrical configuration of hydrocarbon molecules.  
 V. M. Tikhonikhin [Moscow State Univ.]. *Vestn. Moskov. Univ. Fiz. Mat. i Estestv. Nauk* No. 7, 53-78 (1930); cf. C.R. 49, 3700d.—The current-resonance theory, represented by Pauling, which attributes the deviations in C-C distances from the standard values for the single, double, and triple bond, to intermediate bond multiplicities (e.g. percent of double-bond character) is assailed. It is contested that any problems posed by the conjugated double or the aromatic bond are irreconcilable with the original structure theory of A. M. Butlerov. Bond distances are not immutable, and are not solely a function of the multiplicity of the bond, but are primarily determined by the geometric configuration of the atoms involved, whether tetrahedral, plane, or linear. The tacit assumption that in a single bond the C-C distance must be invariably 1.34 Å irrespective of the geometry is unfounded. A classification of C-C bonds is proposed which is based on the configurations of the valences around each, i.e. on their "coordination nos." The system is admittedly phenomenological, insofar as it does not concern itself with the problem of the phys. meaning of the differences of the valence configurations. In the Pauling curve of interat. C-C distance as a function of the percentage of double-bond character the points for  $C_6H_6$ ,  $C_6H_4$ , and graphite are correct, but the point for  $C_6H_6$  is wrong. An alternative graph is given in which the C-C distance is plotted as a function of  $\alpha$ , the fraction of  $\pi$ -bond in bonds of the type  $\sigma + \alpha\pi$ . In this plot the points for  $C_6H_6$  ( $\alpha = 1.0$ ),  $C_6H_4$  ( $\alpha = 0.5$ ),

graphite, and butadiene ( $\alpha = 0.0$ ) lie on a straight line. The justification for taking butadiene instead of ethane is valence state as in  $C_6H_6$ ,  $C_6H_4$ , and graphite, whereas it is not legitimate to identify the  $\sigma$  bond in  $C_6H_6$  with that same bond in  $C_6H_4$ ,  $C_6H_6$ , and graphite. The linearity of this plot would permit calcn. of the C-C distance in butadiene from the distances in  $C_6H_6$ ,  $C_6H_4$ , and graphite. In opposition to the viewpoint which sees the partial double-bond character as a consequence of a resonance of structure, intermediate bond multiplicity is interpreted as the result of an addnl. bond in which the electron of each of the atoms involved takes part also in other bonds; consequently, this addnl.  $\pi$ -bond involves only a fraction of the electrons of each atom of the bond. The type of bond in condensed aromatic rings should, with increasing no. of such rings, gradually approach the structure of the basal layer of graphite, i.e. the bond type  $\sigma + \frac{1}{2}\pi$ . From this point of view, there should be some difference in the interat. distances of the 10-1 bond in naphthalene and the 14-10 bond in anthracene; however, no data are available at this time to support it. Structure formulas of aromatic compds. are written with each bond represented by a full and a dotted line. The types of C-C bonds here discussed are expressed by one-electron wave functions, 4 in each group, describing  $sp^2$ ,  $sp^1$ , and  $sp$  states and corresponding, resp., to a C atom with valences in the tetrahedral configuration (type  $\rightarrow C-$ ), a C atom with valences at an angle of  $120^\circ$  (type  $= C\backslash$ , or the benzene type  $\text{--}C-$ ), or the graphite type  $\text{--}C\text{--}$ , and a C atom with valences at an angle of  $180^\circ$  (acetylene or allene types). In condensed aromatic rings, bonds of a type intermediate between those in benzene and in graphite are probable.

N. Thom

TATEVSKII, V. M.

Levina, R. Ya. Skvarchenko, V. R., Treshchova, E. G., and Tatevskii, V. M. - "Synthesis of hydrocarbons. IX. Diene hydrocarbons in the synthesis of olefinic hydrocarbons with a central double bond." (p. 419)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1950, Vol. 20, No. 3.

TATEVSKY, V.M.

Synthesis of hydrocarbons. X. Partial reduction of conjugated-diene hydrocarbons by sodium in liquid ammonia. R. Ya. Levina, V. R. Skvarchenko, V. M. Tatevsky, and E. G. Treshchova (J. gen. Chem. USSR, 1950, 20, 684-690 [U.S. transl., 721-726]; cf. A., 1950, II, 175).-Partial reduction of  $(\text{CHMe}:\text{CH})_2$  by Na in liquid  $\text{NH}_3$  affords a mixture of the 1 : 2- and 1 : 4-dihydro-compounds,  $\text{CHMe}:\text{CHPr}^n$  (60-65%) and  $(:\text{CHEt})_2$  (35-40%), and is thus unsuitable for the prep. of the latter; Raman-spectral analysis (details given and discussed) proves the presence of both cis- (30%) and trans-forms (70%).  $\text{CHMe}:\text{CHPr}^n$  is synthesised, for comparison purposes, from  $\text{CHMe}:\text{CH}\cdot\text{CH}_2\text{Cl}$  and  $\text{EtMgBr}$ , a mixture of cis- (20%) and trans-forms (80%) being obtained.

Slow addition of  $(\text{CHMe}:\text{CH})_2$  (16g.) in  $\text{Et}_2\text{O}$  to Na (36 g.) in liquid  $\text{NH}_3$  at  $-50^\circ$  to  $-60^\circ$ , stirring for 5-6 hr., and keeping overnight afford a product.  $\text{C}_6\text{H}_{12}$  (75%), b.p.  $67.5^\circ/761$  mm.,  $d_{4}^{20}$  0.6802,  $n_D^{20}$  1.3962 [freed from starting materials by  $(:\text{CH}\cdot\text{CO})_2\text{O}$ ] which is analysed spectrographically (Raman-spectral lines tabulated). Reaction of aq. HCl with  $(\text{CH}_2:\text{CH})_2$  affords 1-chlorobut-2-ene, b.p.  $84^\circ/748$  mm.,  $d_4^{20}$  0.9282,  $n_D^{20}$  1.4350, and 3-chlorobut-1-ene, b.p.  $64^\circ/748$  mm.,  $d_4^{20}$  0.8990,  $n_D^{20}$  1.4150; both isomers react with  $\text{EtMgBr}$  in  $\text{Et}_2\text{O}$  in the usual manner and give identical products, viz., mixed cis- and trans-hex-2-ene. b.p.  $67.5 - 67.7^\circ/748.5$  mm.,  $d_4^{20}$  0.6805,  $n_D^{20}$  1.3940.

E. S. Stern.

TATEVSKII, V. M.

R. Ya. Levina, V. R. Skvarchenko, E. A. Viktorova, V. M. Tatevskii, and E. G. Treshchova, "Synthesis of hydrocarbons. XI. Partial reduction of diene hydrocarbons with a conjugated system of double bonds by sodium in liquid ammonia." (p. 690)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii) 1950, Vol 20, No. 4.

CA

Calculation of the elasticity coefficients of the carbon tetrachloride molecule. A. V. Logansen and V. M. Tatevskii (Univ. Moscow). *Zhur. Fiz. Khim.* 24, 391-412 (1950).—Splitting of Raman lines of  $\text{CCl}_4$ , due to the presence of Cl isotopes is calc'd. by Elyashhevich's method (*C.A.* 40, 6092<sup>a</sup>) with consts. differing from Stepanov's (*C.A.* 40, 189). The results are in good agreement with the expts. of Langeth (*C.A.* 26, 1189), although Rank and Van Horn (*C.I.* 40, 6094<sup>b</sup>) could not reproduce some of L.'s results. J. J. Likerman

CA

2

The resonance theory. V. M. Tatevskii (Ural.  
Moscow). *Zhur. Fiz. Khim.* 24, 597-600 (1950).—The  
theory of chem. resonance is criticized (Pauling *The  
Nature of the Chemical Bond and the Structure of Molecules  
and Crystals*, 1944 (cf. C.A. 38, 5734); Syrkin and  
Dyatkina, *The Chemical Bond and the Structure of Mole-  
cules*, 1946 (C.A. 41, 8010)). J. I. Hickman

10

CA

Chemical structure of hydrocarbons and regularities of their geometric configuration. V. M. Tatevskil (M. V. Lomonosov State Univ., Moscow). *Doklady Akad. Nauk S.S.R.* 76, 287 (K 1950). C-C bonds are classified into 12 basic types, characterized by degree of unsatn. and valence state of the C atoms. The classes are: ordinary C-C link with tetrahedral valence distribution; a link between ordinary tetrahedral C atom and one with planar (120°) valence distribution (alkylethylenes, alkylbenzenes); a link between tetrahedral C and one having linear valence distribution (alkylacetylenes); double link with planar structure and 120° valence angle; single link between 2 planar C atoms with 120° valence angle (conjugated dienes, etc.); triple link with linear valence distribution; link between planar and linear valence forms (conjugated alkynes); single link between 2 atoms with linear valence (diacetylenes); double link between planar and linear forms (allenes); benzenoid C-C links; graphite C-C links; polynuclear C-C links intermediate between the above 2 forms.  
G. M. Kivolapoff

1951

2

CA

Chemical structures of hydrocarbons and regularities in  
bonds of formation. V. M. Tatarskii, V. V. Korobov, and  
N. A. Mousikherishvili (M. V. Lomonosov State Univ.,  
Moscow). Doklady Akad. Nauk S.S.R. 76, 743-6 (1961).  
— The lack of additivity of similar bonds of formation in  
dienes, aromatic compounds, and generally in substances with  
conjugated unsatd. bonds is caused by neglect of the valence  
states of the C atoms comprising the various C—C links in  
these molecules. When bond energies, used as the basis for mol.  
calcd., are calcd. for the various valence conditions possible,  
the results are in excellent agreement with exptl. values.  
The basic bond energy values are as follows:  $\text{H}-\text{C}$  87.517;  
bnd.:  $\text{C}-\text{C}$  80.446;  $\text{C}=\text{C}$  98.853 (as in  $\text{C}_2\text{H}_2$ );  
 $\text{C}:\text{C}$  95.767 (as in  $\text{C}_2\text{H}_4$ );  $\text{C}-\text{C}$  13.146;  $\text{C}-\text{C}$  63.394 (as in toluene);  $\text{C}-\text{C}$  99.136 (as in butadiene);  
 $\text{C}-\text{C}$  98.174 (as in styrene);  $\text{C}-\text{C}$  67.182 (as in  
diphenyl);  $\text{C}=\text{C}$  87.801 (as in  $\text{C}_2\text{H}_2$ );  $\text{C}=\text{C}$  84.447  
(1-10 link in  $\text{C}_6\text{H}_6$ );  $\text{C}=\text{C}$  88.301 ( $\text{C}=\text{C}$  in graphite).  
The CH value is calcd. for the alkanes series and is assumed  
const. for all other types, admittedly introducing an error  
into individual bond energies, but not in the solution of the  
additivity problem. As a typical result,  $\alpha\text{-MeEtC}_2\text{H}_5$  gives  
exptl.  $\Delta H_f^{\circ}$  (as) = -1781.796 kcal.; whereas the calcd. value  
is -1782.864; for chrysene the values are -2639.92 and  
-2637.909, resp.

/151

TATAEVSKY V. M.,

FA 172T11

USSR/Chemistry - Thermodynamics

21 Dec 50

"Chemical Constitution of Hydrocarbons and Regularities in the Heats of Formation," V. M. Tataevskiy, Moscow State U imeni M. V. Lomonosov

"Dok Ak Nauk SSSR" Vol LXXV, No 6, pp 819-822

Postulates 10 subtypes of bond CC in alkanes and 3 subtypes (primary, secondary, tertiary) of bond CH having different heat contents. Calcn of heats of formation on basis of principle of additivity then leads to satisfactory results. Same principle of additivity also ought to apply to other values like mol vol and mol refraction, but this must be checked.

172T11

LEVINA, R. YA., FAYNZIL'BERG, A. A., TATEVSKY, V. M., TRESHCHOVA, YE. G.

Carbinols

"Contact dehydration of dimethylallyl carbinol." Uch. zap. Mosk. un. No. 132, 1950.

Monthly List of Russian Accessions, Library of Congress, October 1952. UNCLASSIFIED.

TATEVSKIY, V. M.

"Some Questions of the Theory of Molecular Systems." Sub 28 Dec 51,  
Moscow Order of Lenin State U imeni M. V. Lomonosov.

Dissertations presented for science and engineering degrees in  
Moscow during 1951.

SO: Sum. No. 480, 9 May 55

TATEVSKIY, V.M.

Author: Tatevskiy, V.M.

Title: Spectroscopy, Ed. by A.V. Frost  
189 pp., illus.

Date: 1951, Moscow

Subject: Spectrum Analysis

Available: Library of Congress, Call No: Q195.73

Source: Lib. of Cong. Subj. Cat., Apr. June 1952

CA

The additive scheme of the heats of formation of hydrocarbons and the problem of the heat of sublimation of graphite. V. M. Talyzin, R. A. Mendelzon, and V. V. Korobov. *Vestn. Akad. Nauk. SSSR*, No. 6, Ser. Fiz.

*Mol. i Katal.*, Nach No. 3, 83-6(1951).—The validity of the additive scheme (cf. C.A. 45, 2322b) is independent of the yet uncertain numerical value of the heat of sublimation  $\Delta H_{f,0}^{\circ}$  of graphite. A change of that datum can cause only a change of the numerical values of the heats of the different types of C—C bonds and of the C—H bond, but cannot affect the validity of the scheme itself. For this statement to be valid, it is sufficient that, for each class of hydrocarbons, the no.  $n$  of C atoms be representable as a linear combination of the nos.  $n_1, n_2, \dots$  of C—C bonds of each type, and of  $m$ , of the form  $n = n_1 + \beta n_2 + \dots + \gamma m$ , where the coeffs.  $\alpha, \beta, \dots, \gamma$  are const. Fulfillment of that condition is illustrated by the examples of alkanes, cyclanes, alkenes, and alkynes. N. Tish

CA

3

**Raman spectra of  $\alpha$ -alkenes.** O. D. Ul'yanova and V. M. Tatevskii. *Vestn. Akad. Nauk. No. 5, Ser. Fiz.-Mat., i Khim. Nauk. No. 3, 87-90 (1951).*—The following Raman frequencies, in  $\text{cm}^{-1}$  (intensities on a 10 scale), were observed in 5 hrs. exposure in excitation with 4350A., dispersion 13 A./mm. 1-C<sub>4</sub>H<sub>8</sub>, 243(2), 263(1), 315(0), 359(0), 400(0), 470(0), 629(2), 635(0), 746(0), 810(3), 875(1), 895(2), 912(5), 931(4), 984(2), 1056(2), 1106(3), 1216(3), 1296(8), 1413(7), 1441(7), 1642(10), 2724(2), 2849(3), 2903(6), 2910(3), 2935(5), 2962(6), 2999(7); 1-C<sub>5</sub>H<sub>8</sub>, 243(1), 281(0), 339(0), 389(0), 435(0), 491(0), 539(1), 615(1), 679(0), 733(0), 782(3), 873(0), 910(4), 925(3), 994(2), 1069(3), 1114(3), 1214(2), 1292(8), 1413(8), 1452(7), 1641(10), 2843(3), 2868(7), 2927(3), 2953(4), 2992(7), 3006(4); 1-C<sub>6</sub>H<sub>8</sub>, 221(0), 240(1), 404(0), 439(0), 466(1), 610(1), 711(1), 729(0), 794(1), 830(0), 834(0), 855(1), 888(3), 906(4), 928(0), 967(1), 998(2), 1029(2), 1061(3), 1081(2), 1111(3), 1210(2), 1294(8), 1372(2), 1416(7), 1439(8), 1469(8), 1641.7(10), 2888(7), 2924(2), 2954(4), 2989(7), 3006(6). Abst. intensities per 1 mole,  $I_{\alpha}$ , were detd. from the measured intensities  $I_1$  of the alkene, by comparison with the measured intensities  $I_2$  of cyclohexane added to alkene, by  $I_{\alpha} \cdot n_1 / I_1 \cdot n_2 = I_1 / I_2$ , where  $n_1$  and  $n_2$  = mol. concns. of the alkene and of cyclohexane, resp., and the abst.  $I_{\alpha}$  for the line 802  $\text{cm}^{-1}$  of cyclohexane was taken = 250 units/mole. Values of  $I_{\alpha}$  for the strongest lines of 1-C<sub>4</sub>H<sub>8</sub>, 1-C<sub>5</sub>H<sub>8</sub>, and 1-C<sub>6</sub>H<sub>8</sub>, are: 910  $\text{cm}^{-1}$ , 16.94, 24.15, 16.96; 1296  $\text{cm}^{-1}$ , 21.52, 110.35, 65.30; 1413  $\text{cm}^{-1}$ , 21.06, 19.47, 26.70; 1440  $\text{cm}^{-1}$ , 21.30, 41.50, 78.05; 1642  $\text{cm}^{-1}$ , 111.1, 123.0, 121.2. There are minor differences between these Raman spectra and those observed by Bashillin and Sterin (*Izv. Akad. SSSR, Ser. fiz.* 11, No. 4, 481 (1947)). Analytical application of the Raman spectra to the detn. of 1-C<sub>4</sub>H<sub>8</sub> in mixt. with C<sub>2</sub>H<sub>6</sub> and cyclohexane was very satisfactory with 25 and 8% 1-C<sub>4</sub>H<sub>8</sub>; the lower limit of the detn. is 3% 1-C<sub>4</sub>H<sub>8</sub>. N. Thon

(A)

2

Some aspects of the theory of chemical structure proposed  
by A. M. Butlerov, V. M. Tatevskii, Vsevolod Mather,  
*Usp. 6, No. 6, Ser. Fiz.-Mat. i Estestven. Nauk No. 4, 53-70*  
(1851).—Review with numerous quotations from Butlerov's  
publications supporting his priority as the true founder of  
structural theory of organic chemistry. G. M. Kosolapoff

APPROVED FOR RELEASE: 07/16/2001

**CIA-RDP86-00513R001755110017-3"**

TATEVSKII, V. M.

"Isomerisation of unsaturated hydrocarbons over metallic oxides. XII. Preparation of methyl pentadienes by dehydration of diisobutyl allyl carbonium over chromium oxide-on-alumina." by R. Ya. Levina, A. A. Fainzil'berg, V. M. Tatevskii, E. G. Berezhina. (p.233)

SO: Journal of General Chemistry (Zhurnal Osnovnoi Khimii) 1951, Volume 21, No. 2

TATEVSKIY, V. M.

184T36

USSR/Chemistry - Resonance Theory

Feb 51

"Letter to the Editor Regarding V. M. Tatevskiy's Article 'On the Theory of Resonance,'" G. V. Chelintsev, Moscow

"Zhur Fiz Khim" Vol XXV, No 2, pp 239, 240

Criticizes V. M. Tatevskiy for (1) usurpation of Chelintsev's priority in criticism of theory of resonance, giving Chelintsev no credit; (2) incomplete criticism of theory based on quantum mech aspects only; (3) acceptance of postulates of dislocation and diffusion of electrons, which in effect retained resonance theory; (4) acceptance

184T36

USSR/Chemistry - Resonance Theory

(Contd.)  
Feb 51

of mesomerism; (5) nonacceptance of Chelintsev's orbital theory.

184T36

184T37

TATEVSKIY, V. M.

USSR/Chemistry - Resonance Theory

Feb 51

"Certain Problems of A. M. Butlerov's Theory of Chemical Structure. II. Chemical Structure of Hydrocarbons and Regularity in Energies of Formation," V. M. Tatevskiy, Moscow State U ment. V. M. Lomonosov

SOV

"Zhur.Fiz.Khim" Vol XXV, No 2, pp 241-254

Rejects mol formulas of A. M. Butlerov as too rigid in light of newer sci knowledge. Calls resonance theory idealistic. States methods for calcn of resonance energy are faulty. Concept of additivity agrees with results from calcn of heat of formation

184T37

USSR/Chemistry - Resonance Theory (Contd) Feb 51

or aromatic hydrocarbons by orbital method or Slater's method. Quantum chem calcns show practically complete additivity.

184T37

## USER/Chemistry - Isotopes

Mar 51

"Calculation of the Equilibria of Isotopic Exchange Reactions," V. M. Tatevskiy, Lab Mol Spectroscopy, [Moscow State U imeni M. V. Lomonosov]

"Zhur. Fiz. Khim." Vol XXXV, No 3, pp 261-273

185T4

Obtained expression for equil consts ( $K_p$ ) depending only on numbers of symmetry by proposed new theorem and 2 new variants of statistical method for calcn of isotope equils. Treated temp dependence of  $K_p$  and showed approx method for its calcn for certain temps using numbers

185T4

## USER/Chemistry - Isotopes (Contd)

Mar 51

of symmetry, geom forms of mols, and collection of fundamental frequencies for only 1 isotopic mol of each type. Ratio of products of chief moments of inertia of isotopic mols depends only on and can be calcd from mass, geom form. Illustrated reactions include isotope-substituted forms of  $CCl_4$ ,  $CH_4$ ,  $H_2O$ ,  $H_2S$ .

185T4

TATEVSKY, V. M.

TATEVSKIY, M. V.

185T5

USSR/Chemistry - Isotopes

Mar 51

"Use of Lemmata of Similarity for the Calculation of the Vibration Spectrum of Isotopic Molecules," M. V. Tatevskiy, Lab Mol Spectroscopy, Moscow State U imeni M. V. Lomonosov

"Zhur Fiz Khim" Vol XXV, No 3, pp 274-282

Indicates method for use of lemmata of similarity for calcn of vibration frequencies of isotopic mols  $XY_n$  using exptl data for mols substituted with other isotopes. Examples include deuterium- and tritium-substituted  $H_2O$ ,  $H_2S$ ,  $H_2Se$ ,  $NH_3$ ,  $PH_3$ ,  $AsH_3$ ,  $CH_4$ ,  $SiH_4$ ,  $GeH_4$ ,  $NH_4^+$ , and  $WO_4^-$ ,  $IO_3^-$ ,  $ReO_4^-$ , substituted with  $D$  or  $T$ .

185T5

TATEVSKIY, V. M.

USSR/Chemistry - Antiknock Fuels

Oct 52

"Spectra of Combination Scattering of Light in C<sub>5</sub>-C<sub>11</sub> Isalkanes With Tertiary Carbon Atoms," Ye. G. Treschova, V. M. Tatevskiy, T. I. Tanttsyrova, A. A. Faynsil'berg, R. Ya. Levina, Moscow State University imeni M. V. Lomonosov.

"Zhur Fiz Khim" Vol XXV, No 10, pp 1239-1247.

Measurements of number and intensity of lines in spectra of combination scattering of 2, 4-dimethylhexane, heptane, octane, and nonane, 2, 4, 5-trimethylhexane, 2, 4, 6-trimethylheptane, and 2, 4, 7-trimethyloctane, in agreement with theoretical conclusions of B. I. Stepanov, showed that different types of branchings of alkane C skeleton are represented by sp characteristics of spectrum.

PA 194T18

TATAYEVSKIY, V. M.

178T15

USSR/Chemistry - Hydrocarbons

1 Feb 51

"Intensity of the Band of the C=C Valency Vibration in Combination Dispersion Spectra of Hydrocarbons," P. A. Akishin, V. M. Tatayevskiy, Moscow State U imeni M. V. Lomonosov

"Izv Ak Nauk SSSR" Vol LXXVI, No 4, pp 527-530

Lists frequencies in  $\text{cm}^{-1}$  produced by C=C bonds, differential intensities per mol in  $\text{cm}^{-1}$ , and integral intensities per mol for 21 unsatd hydrocarbons of different constitution. General relationships established on basis of these data can be used in quant mol analysis and for detg structural elements (isolated C=C bonds).

178T15

TATEVSKIY, V.M.

USSR/Chemistry - Fuels

1 May 51

"Chemical Structure of Hydrocarbons and Regularities  
in the Heats of Formation," V. M. Tatevskiy, V. V.  
Korobov, E. A. Mendzheritskiy, Moscow State U imeni  
M. V. Lomonosov

"Dok Ak Nauk SSSR" Vol LXXVIII, No 1, pp 67-69

The authors studied the heats of formation of 44  
straight and branched-chain hydrocarbons. They  
give a table depicting the increments in the heat  
of formation for the addn of single carbon atoms  
to the chain. Values for  $\Delta H^{\circ}_{\text{C}_n\text{H}_{2n+2}(\text{at})}$  were calcd  
on an additive basis for the temps 0 and 298.16° K.

217T3

TATEVSKIY, V.

A.V.Frost; obituary. Vest.Mosk.un. 7 no.12:131-137 D '52. (MLM 7:9)  
(Frost, Andrei Vladimirovich, 1906-1952)

TATEVSKIY, V. M.

USSR/Chemistry-Hydrocarbons

Feb 52

"Synthesis of Hydrocarbons. XVII. Homomesitones in the Synthesis of Isoparaffinic Hydrocarbons," R. Ya. Levina, N. P. Shusherina, Ye. G. Treshchova, V. M. Tatevskiy, Lab of Org Chem imeni Acad N. D. Zelinskii, Moscow State U

"Zhur Obshch Khim" Vol IXII, no 2 pp 199-208

Developed method to synthesize difficultly obtainable isoparaffins 3, 5-dimethylheptane (I), 3-methyl-5-ethylheptane (II), 3-methyl-5-ethyloctane (III), 3-methyl-5-ethylnonane (IV), 2, 3, 4-trimethylhexane (V), 3, 4, 5-trimethylheptane (VI), none described in the literature. Synthesized I-IV by reaction of mixt of "homomesitones" 3-methylheptene-3-one-5 and 3-methylheptene-2-one-5 (products of condensation of methyl ethyl ketone with  $\text{CaC}_2$ ) with org Mg compds, then dehydration of products (unsatd tert alcs) and catalytic hydrogenation of resulting diene hydrocarbons. V and VI were synthesized in same way with exception that "homomesitones" in this case were 3, 4-dimethylhexene-3-one 5 and 3, 4-dimethylhexene-2-one-5 (products of condensation of methyl ethyl ketone with HCl).

209T14

TATAYVSKIY, V. N.

Sep 52

## USSR/Chemistry - Hydrocarbons

"Raman Spectra of Hydrocarbons of Various Types: III. Raman Spectra of Some Alkyldienes With a System of Isolated or Conjugated Double Bond," Ye.G. Treshchova, V.M. Tatayvskiy, R. Ya. Levina, A.A. Fajnzil'berg, and Ye.A. Viatrova, Moscow State U

Zhur Fiz Khim, Vol 26, No 9, pp 1266-1271 5

The Raman spectra of the following alkyldienes were studied: 2-methyl-pentadiene-1,4; 2,3-dimethylbuta-diene-1,3; 2-methylpentadiene-2,4; heptadiene-2,4; octadiene-2,4. The intensities of the lines of the

261T37

spectrum were measured photometrically in a single objective scale. In the spectrum of alkyldienes with isolated double bonds there were in the range 1,600-1,680 cm<sup>-1</sup> either one strong line with an intensity approx twice as great as that of the alkenes or two strong lines, the total intensity of which was approx twice as great as that of the alkenes. In the spectrum of alkyldienes with conjugated double bonds, the intensity of the characteristic lines in the range of 1600-1680 cm<sup>-1</sup> surpasses the intensity of the characteristic line in this field in the case of alkenes. A comparison was made of the spectra of alkyldienes of normal structure with a system of conjugated double bonds: hexadiene-2,4, heptadiene-2,4, and octadiene-2,4. The authors established the approx recurrence of a series of lines, by frequency and intensity, for all three alkyldienes.

261T37

261T37

TATEVSKIY, V.M.; FROST, A.V., professor, redaktor.

[Chemical structure of hydrocarbons and the regularity of their  
physicochemical properties] Khimicheskoe stroenie uglevodorodov  
i zakonomernosti v ikh fiziko-khimicheskikh svoistvakh. [Moskva]  
Izd-vo Moskovskogo universiteta, 1953. 319 p. (MLR 6:12)  
(Hydrocarbons)

TATEVSKII, V. M.

(3)

Chemical structure of hydrocarbons and the regularities  
in the heats of combustion of liquid alkanes and alkylbenzenes. V. M. Tatevskii and Yu. A. Pentin. *Vestnik*  
*Moskov. Univ.*, 8, Ser. Fiz.-Mat. i Estestven. Nauk.  
No. 3, 69-72 (1953); cf. *C.A.* 45, 8860b; 46, 5906i.—Heats  
of combustion calcd. from the previously developed expres-  
sion,  $-\Delta H = \sum n_i A_i$ , agreed well with  $\Delta H$ 's detd. by expt. —  
for liquid alkanes,  $C_n H_{2n+2}$ .  $\Delta H$  calcd. for 2,3-Me<sub>2</sub>C<sub>6</sub>H<sub>5</sub>  
and 2,2,4-Me<sub>3</sub>C<sub>6</sub>H<sub>3</sub> were higher, and those for 2,2,3,4-Me<sub>4</sub>C<sub>6</sub>H<sub>2</sub> and 2,2,4,4-Me<sub>4</sub>C<sub>6</sub>H<sub>2</sub> were lower, than the exptl.  
values. The reason for these exceptions could not be ex-  
plained. G. Meguerian

10-13-54 I. J. P.

TATEVSKIY, V.M.; PENTIN, Yu.A.

Chemical structure of hydrocarbons and mechanisms of heat of combustion of  
liquid alkanes and alkylbenzenes. Vest. Mosk. un. 8 no.5:69-72 Ky '53.  
(MLRd 6:8)

1. Knfedra fizicheskoy khimi. (Hydrocarbons) (Heat of combustion)

TATEVSKIY, V.M.; KARAPET'YANTS, M.Kh. [authors]; TILICHEYEV, M.D. [redaktor];  
KIREEV, V.A. [reviewer].

"Physicochemical properties of individual hydrocarbons." Edited by M.D.  
Tilicheev. Reviewed by V.A.Kireev. Znur.fiz.khim. 27 no.6:939-940 Je  
'53. (MLRA 6:7)  
(Hydrocarbons)

TATAYEVSKIY, V. M.

USSR/Chemistry - Hydrocarbons

Oct 53

"Raman Spectra of Hydrocarbons of Different Types. IV.  
Raman Spectra of Some Branched Alkanes Containing  
Tertiary Carbon Atoms," Ye. G. Treshchova, V. M.  
Tatayevskiy, A. A. Faynzil'berg, N. P. Shusherina,  
R. Ya. Levina, Moscow State U im M. V. Lomonosov

Zhur Fiz Khim, Vol 27, No 10, pp 1564-71.

Determined the Raman spectra of 2,3-dimethylhexane, 2,3-dimethylheptane, 2,3-dimethyloctane, 2,3,6-trimethylheptane, 3,5-dimethylheptane, 3-methyl-5-ethyloctane, 3,5-dimethylheptane, and 5-methyl-5-ethyloctane. From

272T15

the data obtained, drew conclusions on the frequencies which correspond to definite types of branching.

AKISHIN, P.A.; TATYEVSKIY, V.M.

Intensity of bands of valence vibration of the C≡C bond in Raman spectra  
of hydrocarbons. Doklady Akad. Nauk S.S.R. 89, 287-9 '53. (MIRA 6:3)  
(OA 47 no.20:10349 '53)

1. M.V.Lomonosov State Univ., Moscow.

TATEVSKIY, V.M.

USSR:

539.132  
3714. Rotational Isomerism of 1,2-dichloroethane  
and 1,2-dibromoethane. YU. A. PENIN, YA. S.  
BOGOMOL'CH, D. B. GOREVICH AND V. M. TATEVSKIY  
Dokl. Akad. Nauk SSSR, 89, No. 3, 435-8 (1953) In  
Russian. English translation, U.S. National Sci.  
Found. NSF-tr-38.

The Raman spectra have been recorded photo-  
electrically at various temperatures between 17 and  
112°C. From the relative intensities of the two peaks  
in each spectrum corresponding to the C-halogen  
bond vibrations of the two isomers of each com-  
pound (at 654 and 754 cm<sup>-1</sup> for dichloroethane, and

at 551 and 639 cm<sup>-1</sup> for dibromoethane) at the  
different temperatures, a value close to 0 cal/mole  
was derived for the heat of isomerization of the  
dichloro, and of 770 ± 60 cal/mole for the dibromo  
derivative; this latter figure agrees well with some  
other published figures, and it is concluded that the  
value of 2420 cal/mole, published by Fros (Dokl.  
Akad. Nauk SSSR, 60, 387 (1948)) is erroneous.

R. C. MURRAY

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Cher

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TATEVSKIY, V.M.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr 1954)

Name	Title of Work	Nominated by
Tatevskiy, V.M.	"Chemical Structure of Hydrocarbons and the Laws of their Physicochemical Properties"	Moscow State University imeni M.V. Lomonosov

SP - 8-3064, 7 July 1956

TATEVSKIY, V.M.  
USSR/Chemistry

FD-774

Card 1/1 : Pub 129 11/24  
  
Author : Tatevskiy, V. M.; Pentin, Yu. A.  
  
Title : Chemical structure and regularities in the heats of combustion of liquid alkanes and alkyl benzenes  
  
Periodical : Vest. Mosk. un., Ser. fizikomat. i yeast. nauk, Vol 9, No 2, 81-84, Mar 1954  
  
Abstract : Listed the experimental and calculated values for the heats of combustion of liquid alkanes and of alkyl benzenes. Three tables, Four references (all USSR).  
  
Institution : Chair of Physical Chemistry  
  
Submitted : September 17, 1953

USSR/Chemistry - Physical

TATEVSKIY, V.M.

FD-1677

Card 1/1 : Pub. 129-2/25

Author : Tatevskiy, V. M.; Pentin, Yu. A.

Title : Chemical structure and physicochemical properties of molecules

Periodical : Vest. Mosk. un Ser. fizikomat. i vest. nauk, Vol 10, 21-32, Feb 1955

Abstract : The physicochemical properties of a molecule are related to its structure. Molecules are arranged into classes which are determined by the position in the periodic table, bond angle, and other factors that affect the interatomic distances. The classes are further subdivided into types and the types into subtypes. Thus, hydrocarbon molecules were arranged systematically by structure and correlated with physicochemical properties such as molecular volume, refraction, heat of formation, etc. Ultimately, if the physicochemical properties and the proper constants are known, the structure of a molecule can be predicted. Large table; graphs. No references.

Institution : Chair of Physical Chemistry

Submitted : September 17, 1954

FD-2169

USSR/Chemistry - Physical

Card 1/1 Pub 129-9/20

Author : Pentin, Yu A., and Tatevskiy, V. M.

Title : Infrared absorption spectra of certain alkyl halides and the question of rotational isomerism

Periodical : Vest. Mos. un., Ser. fizikomat. i yest, nauk, 10, No 2, 63-72, Mar 1955

Abstract : Obtained infrared absorption spectra in the region 400-1500  $\text{cm}^{-1}$  for propyl chloride, propyl bromide, isobutyl bromide, n-butyl bromide, isoamyl bromide, 1,2-dichloroethane, 1,2-dibromoethane, 1,2-dibromopropane, and 1,2-disbromobutane. Selected lines for investigating the effects of temperature on relative line intensity and the determination of the relative stability of the rotational isomers of the above compounds. Graphs, formulas. Sixteen references (six USSR; fifteen since 1940)

Institution : Chair of Physical Chemistry

Submitted : October 20, 1954

USSR/Chemistry - Physical

FD-2170

Card 1/1 Pub 129-10/20

Author : Pentin, Yu. A., and Tatevskiy, V. M.

Title : Energy differences and possible configuration of rotational isomers  
of certain alkyl halides

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest, nauk, 10, No 2, 73-82,  
Mar 1955

Abstract : Studied the effect of temperature (24-80 degrees) on the optical  
density of infrared absorption bands and calculated the energy  
differences of rotational isomers of gaseous propyl chloride and  
bromide, n-butyl and isoamyl bromides, 1,2-dichloro and 1,2-  
dibromoethane, and 1,2-dibromopropane. Also conjectured on the  
possible configurations of the rotational isomers of the above  
compounds and drew conclusions on their relative stability from de-  
termined factors. Tables, graphs, diagrams. Twelve references  
(six USSR; all since 1940).

Institution : Chair of Physical Chemistry

Submitted : October 20, 1954

TATEVSKIY, V.M.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 31/49

Authors : Tatevskiy, V. M.

Title : Valent carbons in molecules. A concept on the valent state of atoms

Periodical : Dok. AN SSSR 101/3. 515-516, Mar 21, 1955

Abstract : Data are presented regarding valent carbons of various molecules and the valent state of atoms. It is proven that the geometrical configuration of atoms does not experience any basic changes during the substitution of the given central atom by an atom of another element but of the same group. The configuration remains unchanged (qualitatively) even during the change of one or several atoms directly bound with the given central atom. It is typical, that the geometrical configuration depends, basically, upon the state of the central atom (its valence, series and multiplicity of chemical bonds). Table.

Institution : .....

Presented by : Academician A. N. Frumkin, October 19, 1954

USSR/Chemistry - Physical chemistry

Card 1/2      Pub. 22 - 31/51

Authors : Tatevskly, V. M.

Title : Types of chemical bonds of atoms and interatomic spaces in molecules of halogen derivatives

Periodical : Dok. AN SSSR 101/5, 901-902, Apr 11, 1955

Abstract : The three trivalent states in which a tetravalent carbon atom in molecules of organic compounds can exist are described. It is shown that all chemical carbon-halide bonds in halogen derivatives can be divided into three basic types depending of course upon the valent state of the carbon atom. The interatomic spaces were found to remain approximately constant for bonds belonging to one of the basic types; but, they are different for bonds of different types. Each bond type

Institution : .....

Presented by : Academician N. N. Semenov, October 19, 1954

Card 2/2

Pub. 22 - 31/51

Periodical Dok. AN SSSR 101/5, 901-902, Apr 11, 1955

Abstract It was found to be characterized by a specific interatomic space. The effect of atoms which do not directly participate in the formation of the given chemical bond is explained. Five references: 3 USSR and 2 USA (1934-1953). Table; graphs.

VM  
A  
APPENDIX C: THEORETICAL THERMODYNAMICS. The discussion is concerned with the calculation of standard free enthalpies of formation, and corresponding free enthalpies of combustion, for elements such as H, He, Li, Be, B, C, N, O, F, Ne, Ar, and S. Mol. spectra of org. compds. are interpreted in terms of free energy of formation of 39 alkanes at 0°, 298.16°, and 600°K., and of 30 alkenes and 11 alkylcyclohexanes at 298.16 and 600°K. The exptl. and computed values are compared. See pp. 57-67.

*[Handwritten signature]*

TATEVSKIY, V.M.

✓ Constructional changes in the registration system of the spectrograph DFG-4. A. A. Mal'tsev, M. B. Mayurovich,  
V. A. Kryazhkin, and V. M. Tatevskii (State Univ.,  
Moscow). Pis'ma v Zh. Ekspеримента 1946, No. 2  
124-2. The authors report on the constructional changes

of an automatic registration system. The modification  
permits registration of spectra and the resolving power of  
the instrument.

Werner Jacobson

"APPROVED FOR RELEASE: 07/16/2001

CIA-RDP86-00513R001755110017-3

747EUSKIV L 6  
/ Some charts of undetected frequencies only bude.

APPROVED FOR RELEASE: 07/16/2001

CIA-RDP86-00513R001755110017-3"

TATEVSKIY, V.H.

SHAKHPARONOV, M.I.; TATEVSKIY, V.M.

Concerning the discussion on the theory of molecular structure.  
Zhur.fiz.khim. 30 no.9:2122-2123 S '56. (MIRA 9:12)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.  
(Molecules)

TATEVSKIY, V. M.  
USSR/Physical Chemistry - Molecules. Chemical Bonds. B-4

Abs Jour: Ref Zhur-Khimika, No 5, 1957, 14434

Author : Yu. A. Pentin, V. M. Tatevskiy  
Inst : -  
Title : Energy differences of inverted isomers of certain halo-  
geno derivative hydrocarbons

Orig Pub: Dokl. AN SSSR, 1956, 108, No 2, 290-293

**Abstract:** With the aim of making a study of inverted isomery in alkyl halides 1,2-dihalogeno derivative hydrocarbons, the following spectra were examined: infra-red, comb. of solutions propylchloride (I), propyl bromide (II), n-butyl bromide (III), isoallyl bromide (IV), 1,2-dichloroethane (V), 1,2-dibromoethane (VI), 1,2-dibromopropane (VII). Infra-red spectra (in the region of 400-1500 cm<sup>-1</sup>) were examined in solid, liquid and gaseous states, and the comb. of solutions spectra - in the liquid phase at various temperatures. The relation of frequencies to the trans- or turned inverted isomers was checked by an examination of the

Card 1/4

USSR/Physical Chemistry - Molecules. Chemical Bonds.

B-4

Abs Jour: Ref Zhur-Khimiya, No 5, 1957, 14434

**Abstract:** influence of crystallization on the spectra (during crystallization, lines corresponding to the turned isomer should appear). Energy differences  $\Delta U$  between the turned and trans-isomers, which are determined by temperature progress of special line intensities, are equal to (in cal/mole, first number corresponds to the gaseous, second - to the liquid state): I  $-50 \pm 70$ ;  $-300 \pm 150$ ; II  $-280 \pm 100$ ,  $-440 \pm 100$ ; III  $-50 \pm 150$ ,  $-100 \pm 100$ ; IV  $-490 \pm 80$ ;  $+20 \pm 100$ ; V  $1240 \pm 50$ ,  $0 \pm 60$ ; VI  $1780 \pm 50$ ,  $770 \pm 60$ . VII contains 3 different inverted isomers, in which the atom Br of the group  $\text{CH}_2\text{Br}$  is found in the trans-position in relation corresponding to atom H(I), group  $\text{CH}_3(1a)$  and atom Br(2) of the group  $\text{C}(\text{CH}_3)\text{HBr}$ ;  $U_{1a} - U_2 = \sim 2000$ , (?)  $1020 \pm 250$ ,  $U_1 - U_2 = 1330 \pm 120$ ,  $330 \pm 200$ ;  $U_1 - U_{1a} = -300 - 500$ , (?)  $-670 \pm 100$  (the authors assume that  $U_2 < U_1 < U_{1a}$ ). Values of  $\Delta U$  were determined as the mean values from measurements, conducted for different pairs of bands and

Card 2/4

USSR/Physical Chemistry - Molecules. Chemical Bonds.  
Abs Jour: Ref Zhur-Khimiya, No 5, 1957, 14434

B-4

**Abstract:** the distribution of the C atoms removed from the halogen, so that the isomers decompose into 2 groups, in each of which the C-Hal frequency is practically identical. It was shown, that the experimentally determined value  $\Delta U$  represents the arithmetical mean value of the energy differences of isomers which belong to these two groups. An equation is also obtained which ties in the observed relation of intensities with the energy differences of all isomers of both groups, which thus may be determined in principle if the intensity relationships are measured in a sufficiently wide interval of temperatures.

Card 4/4

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755110017-3"

Category: USSR / Physical Chemistry  
Thermodynamics, Thermochemistry. Equilibrium. Physico-  
chemical analysis. Phase transitions.

B-8

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 29896

Author : Tatevskiy V. M.  
Inst : Academy of Sciences USSR  
Title : Heat of Evaporation, Vapor Tension and Boiling Point of Paraffinic Hydrocarbons (Alkanes)

Orig Pub: Dokl. AN SSSR, 1956, 109, No 1, 131-134

**Abstract:** To calculate heat of evaporation, vapor pressure and boiling point of alkanes, the values of  $\lambda$  and b in the equation  $\lg p = - \lambda/T + b$  (1) ( $\lambda = 4.575$  -- molal heat of evaporation, not corrected for non-ideal nature of gas), are calculated analogously to the previously described manner of calculating the other physico-chemical quantities of alkanes (RZhKhim, 1956, 167), in accordance with the formulas  $\lambda = \sum n_{ij} \lambda_{ij}$  (2) and  $b = \sum n_{ij} b_{ij}$  (3). Values of  $\lambda_{ij}$  and  $b_{ij}$  are calculated, on the basis of available experimental data

Card : 1/2

Category: USSR / Physical Chemistry

Thermodynamics, Thermochemistry. Equilibrium. Physico-chemical analysis. Phase transitions.

B-8

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 29896

for various temperatures within the range of 40-150°; for the same temperatures are calculated, and compared with the experimental values, the  $\lambda$  and  $b$  of 31 alkanes. Boiling points of 65 alkanes, at  $p = 760$  mm Hg, calculated in accordance with formulas 1, 2 and 3, deviate, in most cases, from the experimental data by less than 1°, and only in one instance the difference amounts to 3°.

Card : 2/2

-19-



TATEVSKIY, V..M.

"Methods for the Statistical Computation of the Isotopic Exchange Equilibrium in the Gaseous Phase."

Problemy Kinetiki i Katalizis, v. 9, Izotopy i Kataliz, Moscow, Izd-vo AN SSSR, 1957, 442p.

Most of the papers in this collection were presented at the Conf. on Isotopes in Catalysis which took place in Moscow, Mar 31-Apr 5, 1956.

TA763413, v. 11.

PRIKHOT'KO, A.F.

24(7) p 3 PHASE I BOOK EXPLOITATION Sov/1365  
L'vov. UniversitetMaterialy 1 Vsesoyuznogo soveshchaniya po spektroskopii. t. 1:  
Molekulyarnaya spektroskopiya (Papers of the 10th All-Union  
Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy)  
[L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies  
printed. (Series: Its: Pizichnyy sbornik, vyp. 3/8/)Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po  
spektroskopii. Ed.: Daner, S.L.; Tech. Ed.: Saranyuk, T.V.;  
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Fabrikant, V.A., Doctor of Physical and Mathematical Sciences,  
Korntaidis, V.G., Candidate of Technical Sciences, Rasytsky, J.M.,  
Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K.,  
Candidate of Physical and Mathematical Sciences, Milyanchuk, V.S.,  
A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Pettin, Yu. A., V.M. Tatevskiy, and B.A. Postyshev.  
Study of Rotational Isomerism by Means of  
Spectroscopy

Novak, I.I., and Ye. S. Solov'yev. Rotational Iso- merism and the Effect of Temperature on the Infrared Absorption Spectra of Some Paraffins	300
Postovskaya, A.Y., I.A. Salimov, A.S. Kus'minskiy, and V.N. Tatevskiy. Variation in Structure of Sodium Butadiene Rubber in the Process of Light Oxidation	419
Klaunzen, N.A., and B.A. Dogadkin. Infrared Spectro- scopy Used to Study the Interaction of Rubber and Sulfur	423
Mlevokhotova, N.A. Study of the Chemical Variations of Tetrafluoroethylene ("teflon") Under the In- fluence of Ionizing Radiation by Means of Infrared Spectroscopy	426
Mal'son, E.V., and I. Ya. Podubnyi. Spectroscopic Study of the Macrostructure of Some Diene Polymers	430
Card 27/30	433

TATEVSKIY, V.M.

PRIKHOT'KO, A.F.

24(7) p 3 PHASE I BOOK EXPLOITATION Sov/1365

• L'vov. Universitet

Materialy 1 Vsesoyuznogo soveshchaniya po spektroskopii. t. 1:  
 Molekul'arnaya spektroskopiya (Papers of the 10th All-Union  
 Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy)  
 [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies  
 printed. (Series: Itc: Fizichnyy zhurnal, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po  
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 Fabelinaskiy, I.L., Doctor of Physical and Mathematical Sciences,  
 Fahrman, V.A., Doctor of Physical and Mathematical Sciences,  
 Kornitskiy, V.O., Candidate of Technical Sciences, Rasyakiy, S.N.,  
 Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K.,  
 Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S.,  
 Candidate of Physical and Mathematical Sciences, and Glazberman,  
 A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Kolesova, V.A. Vibrational Spectra of Double-component Phosphate Glasses and Some Crystalline Phosphates	461
Mal'tsev, A.A., Ye. N. Moskvitina, and V.M. Tatevskiy. Study of the Isotopic Effect and VERIFICATION of Infrared Spectrum of Boron Trifluoride	465
Mal'tsev, A.A., Ye. N. Moskvitina, and V.M. Tatevskiy. Quantitative Analysis of Boron Isotopes by Means of Infrared Spectra of Boron Trifluorides	472
Mal'tsev, A.A., Yu. Ya. Kusyakov, and V.M. Tatevskiy. Study of Electron Spectra and Isotopic Effect in Boron Oxygen Compounds	475
Mal'tsev, A.A., V.G. Vinokurov, and V.M. Tatevskiy. Study of Electron Spectra and Isotopic Effect in Boron Oxygen Compounds	480

Card 29/30

TATEVSKIY, V.M.

USSR / Chemistry of High Molecular Compounds.

L.

Abs Jour : Ref. Zhur. - Khimiya, No.2, 1958, 6761.

Author : Salimov, N.A., Postovskaya, A.F., Kuz'minskiy, A.S.,  
Tatevskiy, V.M.

Inst : Moscow University

Title : Investigation of Structural Changes of Sodium Butadiene  
Caoutchouc in the Thermal Oxidation Process using Infra-  
Red Spectroscopy Method.

Orig Pub : Vesti, Mosk. un-ta, Ser. matem., mekhan., astron., fiz.,  
khimiya, 1957, No.1, 164-169.

Abstract : By studying the IK (infra-red) spectra of thermally ox-  
idized sodium butadiene caoutchouc at 140° (60 min. oxidation),  
it has been established that during the oxidation process  
the following oxygen-containing groups were formed:

Card : 1/3

USSR / Chemistry of High Molecular Compounds.

L.

Abs Jour : Ref. Zhur. - Khimiya, No.2, 1958, 6761.

Abstract : hydroperoxides, alcohols, esters, ethers, aldehydes, ketones and acids. After 20 minutes of oxidation there appeared an absorption band of  $\text{-OOH}$  and  $\text{-OH}$  groups at  $3380 \text{ cm}^{-1}$  the intensity of which increased with time of oxidation, while the maximum of absorption shifted to  $3450 \text{ cm}^{-1}$  (after 60 min.); the intensity of the absorption band of the carbonyl groups  $\text{C=O}$  at  $1700 \text{ cm}^{-1}$  increased, while in the range of  $1000\text{-}1400 \text{ cm}^{-1}$  there appeared absorption bands of the groups  $\text{R}_1\text{-C}(\text{*O})\text{-OR}$  at  $1240 \text{ cm}^{-1}$  and of the  $\text{R}_1\text{-O-R}$  (ethers) at  $1165 \text{ cm}^{-1}$ . It was established that the newly appearing absorption bands at  $810$  and  $880 \text{ cm}^{-1}$  belong not to the peroxide, as it has been previously supposed, but to olefins having a structure 1,1,2-trialkylethylene  $\text{R}_1\text{R}_2\text{C=CHR}_3$  and 1,1 dialkylethylene  $\text{R}_1\text{R}_2\text{C}\equiv\text{CH}_2$ . In the course of oxidation, the intensity of the absorption bands of double bonds  $\text{C=C}$  1,2 ( $910$  and  $992 \text{ cm}^{-1}$ ) 1,4 - trans ( $965 \text{ cm}^{-1}$ ) and 1,4 - cis ( $680 \text{ cm}^{-1}$ ) was significantly decreased; an

Card : 2/3

USSR / Chemistry of High Molecular Compounds.

L.

Abs Jour : Ref. Zhur. - Khimiya, No.2, 1958, 6761.

Abstract : analogous decrease of intensities was also observed for absorption bands of double bonds C = C at 1640 cm<sup>-1</sup> and for valence oscillation C-H of double bonds at 2979, 3019 and 3080 cm<sup>-1</sup>; a decrease of absorption bands of methylene groups -CH at 720, 2856 and 2929 cm<sup>-1</sup> showed that O atoms in addition to double bonding attach themselves also to C atoms located in  $\alpha$  position to the double bonds. An increase in intensity of the absorption band at 3400 cm<sup>-1</sup> is linked to the formation of hydroxyl rather than hydroperoxide groups as it was confirmed by the results of the iodometric method.

Card : 3/3

The Apparatus for Production of Raman Scattering Spectra of  
Gaseous Substances. 51-6-22/26

(Fig.1). The apparatus was used to study CO<sub>2</sub> gas. Spectrum of CO<sub>2</sub> at 3-6 atm was photographed using a spectrograph MCh -51 with a short-focus camera. At 20 Å in the light source the CO<sub>2</sub> doublet 1286-1388 cm<sup>-1</sup> was obtained after an exposure of several minutes. Fig. 2 shows this doublet obtained at 3 atm and 20 minute exposure. Two students of the Moscow State University, A.S. Bayshev and Yu.I. Kotov took part in this work. There are 2 figures and 5 references, 2 of which are Slavic.

SUBMITTED: January 12, 1957.

AVAILABLE: Library of Congress.

Card 2/2

Tatevskiy, V. M.

51-3-3/14

AUTHORS: Pozdyshev, V. A., Pentin, Yu. A. and Tatevskiy, V. M.

TITLE: Infrared Spectra of Absorption by Certain Halogenated Alkanes in Liquid and Solid States and the Problem of Number and Configuration of Rotational Isomers.  
(Infrakrasnyye spektry pogloshcheniya nekotorykh galoidalkanov v zhidkem i tverdom sostoyaniyakh i vopros o chisle i konfiguratsiyakh poverotnykh izomerov.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.III, Nr.3, pp.211-220.  
(USSR)

ABSTRACT: At low temperatures concentrations of certain isomers are so small that their spectral lines or bands disappear. A "freezing" method based on this effect (Refs.1, 2, 3) was used by the present authors for comparison of infrared spectra of absorption by liquids and frozen substances. The results obtained were used to find the number, configuration and relative stability of rotational isomers in certain fairly complex halogenated alkanes.

Card 1/4 The following substances were studied: (1) 1,2-dichloroethane,

51-3-3/14

Infrared Spectra of Absorption by Certain Halogenated Alkanes in Liquid and Solid States and the Problem of Number and Configuration of Rotational Isomers.

(2) propyl chloride, (3) 1,2-dibromopropane,  
(4) 1,2-dibromobutane, (5) isobutyl bromide,  
(6) isoamyl bromide, (7) 1,4-dibromobutane. Infrared absorption spectra of these substances were obtained for the region of 450 to 1500  $\text{cm}^{-1}$ . In freezing of the liquids the lowest temperature used was about -175°C. Figs. 2 & 3 show spectra of the substances studied in liquid and solid state respectively. For 1,2-dichloroethane three  $C_{2h}$  rotational forms were found and two  $C_2$  forms. In the solid state only one  $C_{2h}$  form remains. Rotational isomeric configurations of propylchloride are two in number ( $C_S$  and  $C_1$  forms). In the solid state only one trans-form remains in propylchloride. The 618  $\text{cm}^{-1}$  frequency was difficult to interpret. Infrared spectra of the liquid and crystalline states of isobutyl bromide were identical. The authors conclude that either  $C_S$  and  $C_1$  configurations exist both in the

Card 2/4

51-3-3/14

Infrared Spectra of Absorption by Certain Halogenated Alkanes in  
Liquid and Solid States and the Problem of Number and Configuration  
of Rotational Isomers.

liquid and solid states, or only one configuration exists in both states. The authors find themselves unable to decide this point. For 1,2-dibromopropane three rotational isomers were suggested. Again no difference between the liquid and solid-state spectra was observed. The  $1138\text{ cm}^{-1}$  frequency, which is more intense in the solid state, is assigned to the trans-distribution of bromine atoms, the  $1228$  and  $1203\text{ cm}^{-1}$  frequencies are assigned to the two other isomers. Molecules of isooamyl bromide and 1,2-dibromobutane have each two C-C bonds which permit rotational isomerism. In both these substances two rotational isomeric configurations are observed, both of which are stable in liquid and solid states. For 1,4-dibromobutane six theoretical configurations of the liquid state are shown in Fig. 5. In the crystalline state of this substance only one isomer remains which has a mirror-rotational axis of the

Card 3/4

51-3-3/14

Infrared Spectra of Absorption by Certain Halogenated Alkanes in  
Liquid and Solid States and the Problem of Number and Configuration  
of Rotational Isomers.

second order (Fig. 5, Formula 6). There are 5 figures  
and 20 references, 4 of which are Slavic.

SUBMITTED: January 8, 1957.

AVAILABLE: Library of Congress

Card 4/4

POSTOVSKAYA, A.P.; SALIMOV, M.A.; KUZ'MINSKIY, A.S.; TATEVSKIY, V.M.

Structural changes of sodium-butadiene rubber in the process of  
light oxidation. *Fiz. sbor. no.3:423-427 '57.* (MIRA 11:8)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti i  
Khimicheskiy fakul'tet Moskovskogo ordena Lenina i ordena Trudovogo  
Krasnogo Znameni gosudarstvennogo universiteta im. M.V. Lomonosova.  
(Rubber-Spectra) (Oxidation)

TATEVSKIY, V.M.

Statistical calculations of the isotope exchange equilibria in the  
gaseous state. Probl. kin. i kat. 9:339-344 '57. (MIRA 11;3)  
(Gases) (Isotopes)

83635

S/081/60/000/015/001/01<sup>4</sup>  
A006/A001

5.2400A

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 15, p. 15, # 60232

AUTHORS: Mal'tsev, A.A., Kuzyakov, Yu.Ya., Tatevskiy, V.M. (I)  
Mal'tsev, A.A., Vinokurov, V.G., Tatevskiy, V.M. (II)TITLE: Study of Electron Spectra and of the Isotopic Effect in Oxygen  
Boron Compounds. I.  $\beta$ -Bands of BO Molecules. II. "Boric Acid"  
Bands

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1957, No. 3 (8), pp. 475-480; 480-485

TEXT: I. АДФС-3 (DFS-3) spectrograph (2A/mm dispersion) was used to investigate the emission spectrum of BO  $\beta$ -bands ( $B^2\Sigma - X^2\Sigma$  transition) in the arc and a discharge tube with a hot hollow cathode containing  $B_2O_3$ . Rotation analysis of 0 - 0, 0 - 1, 0 - 2, 0 - 3, 1 - 4, 1 - 5, 2 - 5, 2 - 6, and 3 - 4 bands was made, and by the method of least squares the following rotational constants (in  $\text{cm}^{-1}$ ) of the  $B^2\Sigma$  state were obtained:  $B_e = 1.5192$ ,  $\alpha_e = 0.0210$ ,  $D_e = 7.4 \cdot 10^{-6}$  and  $\beta_e = 2.0 \cdot 10^{-6}$ . It is shown that divergence of Sheibe's rotational constant values (Sheibe, Z. Phys., 1930, Vol. 60, p. 74) with those of Djenkins and McKellar (Djenkins, McKellar, Phys. Rev. 1932, Vol. 42, p. 464) Card 1/3

83635

S/081/60/000/015/001/01<sup>4</sup>  
A006/A001

Study of Electron Spectra and of the Isotopic Effect in Oxygen Boron Compounds.  
I.  $\beta$ -Bands of BO Molecules. II. "Boric Acid" Bands

can be explained by the inaccurate treating of experimental data by Sheibe. The method of least squares was used to recalculate Sheibe's data for the  $X^2\Sigma$  state. In all bands spin doubling was observed.

II. Spectrographs with diffraction gratings were used to investigate so-called fluctuation bands of boric acid, located in the 3700 - 6800 Å range. The following spectrum sources were used: a discharge tube with a hot hollow cathode containing boron or boron-anhydride in an atmosphere of He and O<sub>2</sub> mixture, and an oxygen-hydrogen flame into which boric acid solution was introduced. At a high resolution the complicated rotational structure with several edges was observed for the majority of bands. The use of boron concentrated to 85% with a B<sup>10</sup> isotope, allowed the determination of isotope band edges, shifted towards the short-wave side by about 6,5 and 5 Å respectively for bands in the 5450 and 5750 Å range. This result rejects Singh's theory (Singh, N.L., Proc. Indian Acad. Sci., 1949, Vol. A 29, p. 424) who relates the fluctuation bands of boric acid to the BO molecule. According to Singh the isotopic bands must be shifted to the long-wave side by 22 and 44 Å respectively. When introducing to the spectrum source heavy water vapors, no isotopic effect is revealed in the

Card 2/3

83635

S/081/60/000/015/001/014  
A006/A001

Study of Electron Spectra and of the Isotopic Effect in Oxygen Boron Compounds,  
I.  $\beta$ -Bands of BO Molecules, II. "Boric Acid" Bands

fluctuation bands of the boric acid. This indicates the absence of hydrogen in the molecule composition giving rise to these bands. It is assumed that the fluctuation bands of the boric acid belong to the multi-atomic oxygen compound of boron,  $B_xO_y$ .

A. Mal'tsev

Translator's note: This is the full translation of the original Russian abstract.

X

Card 3/3

CH<sub>2</sub>Br, CH<sub>2</sub>ClBr, CH<sub>2</sub>Br<sub>2</sub>, and CH<sub>2</sub>BrCH<sub>2</sub>X (X = Cl, Br, I) were determined. The C-Br distance in CH<sub>2</sub>Br<sub>2</sub> is 1.93 Å; in the Br衍生物 of styrene it is 1.88 Å. The distance C-I in the I<sub>2</sub>Cl is 2.18 Å instead of 2.32 Å. Cf. distance C-Cl in the I<sub>2</sub>Cl is 2.18 Å instead of 2.32 Å.

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